

ENERGY SERVICES Bulletin

The energy and planning resource for WAPA utilities

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WESTERN AREA POWER ADMINISTRATION



MRES, city of Pierre launch first South Dakota solar farm

Partners and stakeholders turned out in force to cut the ribbon on South Dakota's first utility-scale solar farm. From left: Hunter Roberts, assistant energy director, South Dakota Governor's Office; Jeff Peters, director of federal & distributed power programs, Missouri River Energy Services; Harold Schiebout, president, MRES board of directors; Pierre Mayor Laurie Gill; Tom Heller, MRES CEO; Noel Rahn, chairman of Geronimo Energy; and Leon Schochenmaier, city administrator, Pierre Municipal Utilities. (Photo by ©2016. Patrick Callahan).

The largest solar farm in South Dakota began producing electricity for Missouri River Energy Services (MRES) customers, Sept. 30, after officials cut the ribbon on the one-megawatt (MW) array at the Pierre Regional Airport.

The solar photovoltaic project, a joint effort by MRES, the city of Pierre and Geronimo Energy of Edina, Minnesota, covers 9 acres and will generate enough electricity to power 200 homes.

MRES CEO Tom Heller acknowledged that while the facility was significant for the state, it was nevertheless intended only as a demonstration project. "It's not large. It's the first one we've done. We just

want to see what it will do," Heller said in an interview with a local newspaper.

Identifying partners

That does not mean that bringing the project to completion was a simple task, however. "It doesn't matter if the project is 1 MW or 100 MW, you have the same number of parts from planning perspective," explained Jeff

continued on Page 2

inside

3 Energy competition

6 ACEEE report

7 Co-ops are big business

8 Commercial upgrades calculator

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Pierre Utilities Director Brad Palmer (left) and Lead Lineman Devin Harris take a moment to enjoy a job well done. Harris was instrumental in tying the airport solar project to the city's distribution system.

Peters, MRES director of federal and distributed power programs. "The sheer number of stakeholders who need to be engaged makes the process daunting."

Peters ticked off a list that included environmental groups, Native American tribes, the Federal Aviation Administration, city and state regulators and the transmission provider (WAPA). "Even the local newspaper could be considered a stakeholder," he pointed out. "You have to make sure you identify all of the interested parties and keep them updated on your progress."

The distribution provider—Pierre Municipal Utilities—was on board with the project from the beginning. "Overall, the community was very much in favor of the project and excited to be hosting the largest solar facility in the state," said Utilities Director Brad Palmer.

Geronimo Energy, developer and owner of "Pierre Solar LLC," was another piece of the puzzle that slotted in easily. MRES has a relationship with the company that includes power purchase agreements for the output of two wind energy facilities in Minnesota. The innovative 25-year contract Geronimo structured reduced costs for MRES versus a more traditional deal. The entire output of the solar project will become part of MRES's wholesale power supply for the benefit of its 60 member communities.

Building easier, not easy

After conducting a solar feasibility study with Geronimo in 2015, MRES chose Pierre for its first solar project.

As a solar site, the Pierre Regional Airport offered many advantages, including a surprisingly high number of sun days and its status as a brownfield. "MRES didn't want to use any cropland for the demonstration, or property that had residential or commercial potential," explained Joni Livingston, MRES director of communications and member services.

The proposed site also boasted a southward slope with no obstructions and no need to build transmission. "This was a 'behind the meter' installation," said Peters.

Palmer noted that the location was about as close to a substation as you can get, making it easy to tie into the city's distribution system. The biggest challenge, he added, came in the form of paperwork. "The FAA [Federal Aviation Administration] had several requirements, including a 'glint and glare' study," Palmer noted. "Another wrinkle is that the Department of Defense was the previous owner of the airport. There were some strings attached when they deeded it to the city, so that added to the authorizations we needed. Eventually, everyone signed off, so it wasn't so much a barrier as it was just a matter of lengthy application process."

Up, running

Now that the Pierre Solar LLC has been operational for a few weeks, MRES is just beginning the learning phase of its demonstration. "We are hoping to learn more about interconnecting with the local distribution system, and the array's effect on the community's power quality and reliability," Livingston said. "We will be watching to see how much electricity it produces and at what time of day and how that relates to peak demand. Once we have that information, it may lead to more solar installations."

Palmer pointed out that there is room at the Pierre Regional Airport for the solar array to expand. He likes the idea of utility-scale and community solar as a way of giving customers more clean energy. "From the utility standpoint, it is easier to integrate and safer for our workers," Palmer acknowledged. "The economy of scale also makes it more cost effective for the consumers."

For Peters, the lessons so far are holistic rather than technical. "Each project is different, so you will learn something new with each one," he said. "The planning process can always improve." ■

WAPA customers excel in energy competition

The Georgetown University Energy Prize is making WAPA feel like parents of talented children who are playing the same sport but are all on different teams. We know there can be only one winner but we are rooting for all of them and, of course, we are as proud as we can be of their accomplishments.

Among the 50 communities competing are WAPA municipal customers Fort Collins and Aspen, Colorado, and Palo Alto, California. The three cities are now in the semifinalist stage of the multi-year competition to reduce their electric and gas consumption in a sustainable and replicable way.

To enter the contest, each community submitted a long-term energy-saving plan with commitments to policies and projects by residential associations, governments, institutions or businesses in the community. In the fourth stage, beginning January 2017, finalists will be selected for their energy-saving performance over the previous two years. The criteria also include innovation, potential for replication, likely future performance and program accessibility for all residents. The judging panel will choose the winner from this group to receive a \$5-million prize to use to further their community energy plans.

Motivations beyond money

WAPA customers competing for the prize have a track record of designing successful energy-saving programs and engaging customers. It makes sense that they would put that experience to work to earn a \$5-million prize to further their efforts, but there are other reasons for competing, too.

It is all about the data for the city of Aspen, acknowledged Utilities Efficiency Specialist Ryland French during his presentation at the Rocky Mountain Utility Efficiency Exchange. "The information we collect will be normalized based on weather, population and other factors," he explained. "It will give us an aggregate look at community energy use that we didn't have before."

Fort Collins Utilities has been pursuing aggressive energy efficiency and greenhouse gas mitigation goals for several years now, and the ramped-up time scale of the competition provided an excuse to pilot new innovative programs. "We are coming at it from a research perspective," said Project Manager Katy Bigner. "It gives us another way to drive greater community involvement in achieving our Climate Action Plan."

Get community involved

Since both cities already had active programs for reducing energy use, it made marketing sense to rebrand the competition with a local name. "We

continued on Page 4



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wanted to leverage community pride,” said French. “Highlighting the competition with other cities helped to create enthusiasm.”

So the GUEP became the Aspen Energy Challenge in Aspen and Lose-a-Watt in Fort Collins.

To its established foundation of energy coaching, home audits and rebates, Aspen added outreach tailored to specific community segments. Program promotion material for home audits pictured city residents who had actually received the assessments, allowing customers to see that their neighbors were participating. A school district-wide retrofit project of lighting and controls became a teaching tool and turned students into advocates for energy conservation.

Working with the Poudre School District has been central to Fort Collins’s strategy, as well. “We’ve focused on small education programs, because when you get kids excited about something, they run home and tell their parents,” said Bigner.

The city also enlisted a sorority from Colorado State University for a “Porchlight Campaign.” Sorority sisters walked through neighborhoods making note of homes that had incandescent bulbs in their porch fixtures. The students would talk to the homeowners and offer to replace the conventional lights with compact fluorescent lamps.

More than one way to tell story

Outreach is a challenge for all utilities, whether competing for a multi-million dollar prize or just trying to get customers to sign up for a new demand response program. Aspen and Fort Collins pursued some proven strategies, like engaging students, but used the competition to experiment with different approaches too.

For Aspen, success came from taking a simple message and spreading it through as many avenues as possible, appealing to many different motivations. When a promotion offer-

ing residents a free Nest thermostat was “leaked,” only two people called. However, when the offer was officially announced in the city’s email newsletter, 30 homeowners called before 9 a.m. to get their Nest.

The free home energy assessment program was another offer that didn’t take off until the second announcement. “The first time we promoted it was before the Aspen Energy Challenge branding,” French recalled. “We put the offer in community partner e-newsletters and from mid-March to May 2015, only 50 people signed up for audits.”

By August 2016, when the city offered the second round of free home energy audits, the Aspen Energy Challenge was well established. The offer appeared in the competition’s dedicated newsletter, as well as, newspaper and radio ads, on the Energy Challenge website, posters, social media, local television, events and more. “We talked generally not just about saving energy and money, but also about being green, joining the community, competing for the Prize, comfort, health and safety and tech trends,” said French.

Customers claimed all 25 free audits in only seven days, so Aspen continued to promote audits at the regular incentive level of \$100 after the rebate. “We had enough traction in the community that there were 24 more sign-ups over the last three weeks of August,” he said. “They were attracted by the free offer, but continued to participate after the free audits ran out.”

Fort Collins decided to come up with a marketing campaign that differed from the one it had used prior to the competition. “We are not only testing out innovative programs, we are looking at different ways to market them, too,” Bigner said.

A sociologist the utility consulted had done research that indicated people find open-ended calls to action confusing. “When you say, ‘turn down your thermostat,’ people don’t really

know how much they need to make a difference,” she pointed out. “The marketing campaign is focused on taking specific steps to cut down on energy use, and then moving to the next level.”

The contest website provides visitors with an interactive chart that categorizes actions as easy, medium or advanced, and includes steps for renters and home owners, different home systems and appliances. For example, easy steps for lighting include turning lights off when not in use and replacing conventional incandescent bulbs with one of the newer, high-efficiency options. Advanced measures include buying large appliances, installing solar thermal or photovoltaic systems and investing in building shell upgrades. The chart indicates measures for which rebates are available.

Creating competition between businesses has paid off for the utility. Although the contest does not count energy savings by business customers, businesses can compete with each other to see how much energy their employees can save at home. Lose a Watt created the Workwise Challenge to get local businesses within the city limits involved. Employees install a Home Conservation Kit the program supplies, and then tell their stories on the website. Participating businesses earn recognition and employees have the chance to win prizes. The strategy has resulted in an 86,000 kilowatt-hours in savings.

Some things work

As the end of Stage 3 of the competition draws near (Dec. 31), contestants have had time to evaluate some of their strategies and draw a few conclusions.

Working with school districts was a success for both utilities, showing once again that it is never too soon to reach out to tomorrow’s consumers.

Affordable housing energy up-

continued on Page 5



grades proved especially successful in Aspen, a resort community with a large demographic of seasonal workers. "We were able to do 400 units in only a couple of months. The key was focusing on the process and working with the city council and county commission," French recalled.

The utility matched the upgrades with outreach to tenants and landlords. "Seasonal tenants can't be expected to know what 0 through 5 on a radiator dial means in terms of actual temperature, or what to do if the solar thermal system on a unit isn't working," French said. "To maintain the gains from the upgrades, we had to educate the people who lived in the buildings and managed them."

In addition to the success of the business competition, streamlining its energy-efficiency upgrade program for homeowners has been a success for Fort Collins. "We walk the customer through the whole process from audit to completion," said Bigner.

Others, not so much

Having a chance to pilot new ideas and find out more about what makes consumers tick has been a frequently

cited motive for participating in the Georgetown University Energy Prize. The participating utilities already have lessons under their belts, some a surprise and others not.

Aspen is a city of large vacation homes and those homeowners are an especially tough audience for a message of energy efficiency. "We have tried promoting the competition through the food and wine festival, peer pressure, talking about savings and reaching out to property managers. No luck," French admitted.

He added that Park City, Utah, another competitor with a similar demographic profile, was having the same problem.

Given the number of young consumers in the college town, Fort Collins thought the Joule-Bug gaming application might be a good way to engage customers in saving energy. "It turned out to be good for only about a year," Bigner noted. "It required too much effort to sustain over the two years of competition."

Enlisting energy leaders to promote the competition through social networking was another strategy that ultimately offered to little savings for the effort it required, she said.

Crowdfunding to help a low-income customer make home efficiency improvements was another idea that didn't pan out. "We raised only \$200 to help a single-mother schoolteacher. But I think that approach might still be successful for a nonprofit or faith-based organization, for example," Bigner observed.

After the finish line

Whoever wins the Georgetown University Energy Prize, the participants can look forward to gaining solid data about their customers' energy use, along with a clearer idea of what drives customer engagement.

After being judged for their performance in Stage 3, the selected finalists will submit a report on how their programs supported the community's plan and how they can be applied to longer-term strategies. "We expect to be able to learn plenty from the other participants," said Bigner.

While a \$5-million prize would be great—especially if a WAPA customer wins it—the lessons that come from the competition may well be the greatest prize, and consumers and utilities alike will be winners. ■

ACEEE report:

Energy efficiency a critical resource for meeting demand, environmental goals

The combined savings from appliance and equipment efficiency standards, utility-sector energy-efficiency programs and building codes since 1990 represent the third-largest electricity resource in the nation, according to a new report from the American Council for an Energy Efficient Economy (ACEEE). Moreover, increased use of these policies could potentially make it the US's largest electricity resource by 2030.

Growing economy, flat energy use

The Greatest Energy Story You Haven't Heard: How Investing in Energy Efficiency Changed the US Power Sector and Gave Us a Tool to Tackle Climate Change, released in August, seeks to correct the oversight of the title. By quantifying the energy savings and other benefits from a set of energy-efficiency programs and policies, the paper details the quiet success story that started 40 years ago.

Following the 1973 oil crisis, a diverse group of scientists, analysts and policymakers began to develop strategies to reduce energy waste and use less energy to deliver the same or better services. As a result, our gross domestic product increased by 149 percent from 1980 to 2014 while energy use in the United States increased by just 26 percent. Without energy-efficiency, we would need the equivalent of 313 additional power plants to meet the country's energy demands.

Utilities making the business case for customer programs will find data to show that energy efficiency creates US jobs, reduces energy burdens for struggling customers and strengthens

community resilience. Commercial customers will be interested to learn that it also improves their bottom line and returns at least double its investment. Homeowners save an average of \$840 annually through energy efficiency and have the potential to save more.

Fighting climate change

Just as important as the economic benefits is ACEEE's finding that energy efficiency policies can play a major role in compliance with the Environmental Protection Agency's Clean Power Plan. Most states could meet at least 25 percent of their emissions reduction requirements through efficiency policies and the resulting investments, and many could achieve 100 percent.

Utilities understand that the cleanest kilowatt-hour is the one never used. Those 313 power plants that were never built would have emitted 490 tons of carbon dioxide by 2015. The report states that well-designed policies could save another 1,000 terawatts and avoid all the accompanying emissions.

The successful policies cited in the report include:



- Appliance and equipment efficiency standards that enforce minimum performance requirements while still leaving consumers a wide array of more efficient products to choose among.
- Building energy codes, which set minimum requirements for energy-efficient design and construction for new and renovated buildings.
- Utility energy-efficiency targets and energy savings goals to meet through programs that help customers save energy.
- Utility regulatory reforms that incentivize utilities to provide energy-efficiency services to customers instead of selling more electricity and investing in more electricity generation resources.

continued on Page 7

Report:

Electric cooperatives are big business

A WAPA customer appeared on a list of the 300 largest cooperatives and mutual organizations in the world, released by the International Cooperative Alliance (ICA) during the International Summit of Cooperatives in Quebec, Canada, Oct. 11-13. wcm20162001

According to the 2016 World Cooperative Monitor, Basin Electric Power Cooperative ranked 215th with \$2.25 billion in revenue—which the report calls “turnover”—up 14 places from last year. Two more WAPA customers, Tri-State Generation and Transmission Association and Great River Energy, appeared among the Top 20 in the industry and utility category, with \$1.4 billion and \$1.2 billion in turnover respectively. Within the overall study, U.S. electric co-ops dominated the industry and utilities category with 11 organizations in the Top 20.

From a global perspective, however, energy cooperatives represent only a small portion of the organizations built on the cooperative business model. Insurance and agricultural/food groups comprise 64 percent of all co-ops with revenues of \$100 million or more, topping all categories. The 2016 edition of the monitor is based on information submitted by 2,370 cooperatives from 63 countries.

Even so, electric cooperatives are a big business in the US, owning and maintaining 42 percent of the nation’s electrical distribution lines, generating 5 percent of its electricity and employing 72,000 people. Such figures support the ICA’s



vision of cooperative organizations creating jobs, empowering citizens and building communities. That is a pretty good description of WAPA customers, if we do say so ourselves.

The World Cooperative Monitor collects and analyzes data on the world’s largest co-operative and mutual organizations and other enterprises controlled by co-operatives. The International Cooperative Alliance produced the report in conjunction with the European Research Institute on Cooperative and Social Enterprises. ■

ACEEE report from Page 6

Barriers remain

The report acknowledges that in spite of the many benefits energy efficiency offers to society, there are still barriers to widespread adoption.

Consumer awareness of energy performance is still limited and data on their energy use is often not available to them. Split incentives, such as rental properties, are another common problem. Building owners have little reason to make property improvements if they are not paying the utility bills.

Beyond the consumer’s control are regulatory, legal and pricing issues. Business models that tie profits to selling more energy and making capital investment discourage investments in energy efficiency. The environmental, health and security costs to society of energy production and transmission are not factored into energy prices. Although energy efficiency helps reduce these costs, the savings are rarely recognized.

Measuring the effects of energy

efficiency still poses a challenge, as utility program managers are well aware. However, recent advances in data availability and analytics are making this task easier.

You can download *The Greatest Energy Story You Haven’t Heard* for free and share it with your board of directors, resource planners and program managers. Take a moment to congratulate your colleagues on a successful strategy and then start planning how to keep on succeeding. ■

Calculator makes case for commercial property upgrades

Energy-efficiency projects for commercial buildings offer many benefits, including a positive effect on the bottom line, yet getting approval to fund such upgrades continues to be a challenge. To help property managers understand and assess the financial value of investing in a property's energy performance, the Better Buildings Initiative and USAA Real Estate Company created the Building Upgrade Value Calculator (BUVC).

Most real estate and business owners prioritize money for "good news" property improvements like tenant improvements and leasing commissions when allocating capital. Efficiency projects may fail to make the list for a number of reasons, including payback times that exceed industry standards or the perception that energy retrofits are too complicated. Another problem is that the capital expenditure for energy retrofits often is not underwritten when an asset is purchased or developed, so spending capital lowers investor dividends and yield.

USAA Real Estate Company, which manages about \$7 billion in real estate assets, developed the Excel-based analysis tool to help their property managers evaluate the financial returns of energy performance projects in investor-owned real estate. Energy Star partnered with USAA on the second version of BUCV to expand its functionality and make the tool widely available to the broader industry. You can download it for free from the Energy Star website.

The user enters information, such as square footage, annual utility bill, the projected cost and savings for each investment and financing terms, to determine a particular investment's energy and financial benefits. BUVC allows you to calculate the costs and benefits of base building energy-efficiency measures for both the owner and each tenant under a variety of lease types—full service gross, modified gross, triple net. The results can be either printed



as a summary report, or generated as a customized letter to present to senior management to make the business case and secure funding.

USAA continues to use the calculator to reach its Better Buildings Challenge goal of reducing energy use by 20 percent. Also, the Building Owners and Managers Association International has included the tool in its Energy Efficiency Program.

Your key accounts managers can use the BUVC to help commercial real estate customers understand the value of making energy-efficiency improvements on their properties. Increasing funding for such projects can reduce energy use in some of the most energy-intensive buildings in your territory. Efficiency upgrades can also increase asset value and net operating income for large utility customers, while keeping their tenants happy. That is a lot of value for the calculator. ■

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